

# Renewable Energy Vision & Development *at* Blue Lake Rancheria

*Prepared for:*

**U.S. Department of Energy**

**Commercial-Scale Renewable Energy Development and Finance Workshop**

**National Renewable Energy Laboratory (NREL)**

*September 1, 2015*



[www.bluelakerancheria-nsn.gov](http://www.bluelakerancheria-nsn.gov)

# Overview

- ❖ Introductions
  - Jana Ganion, Energy Director
- ❖ Renewable Energy Vision & Drivers
- ❖ Current Energy Projects
- ❖ START Project
- ❖ Future Efforts

Mad River Residents



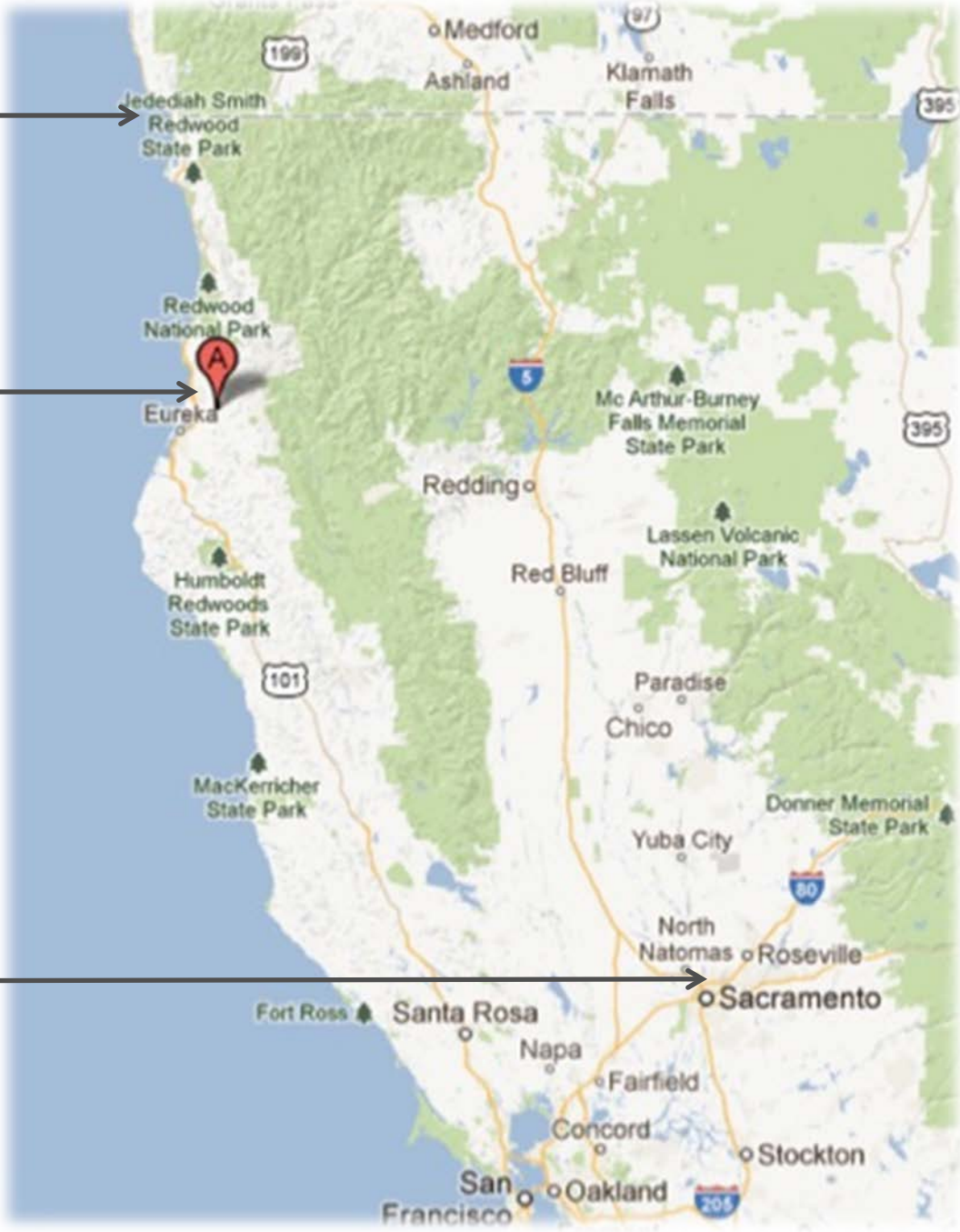
Photo courtesy of fishingwithjd.com

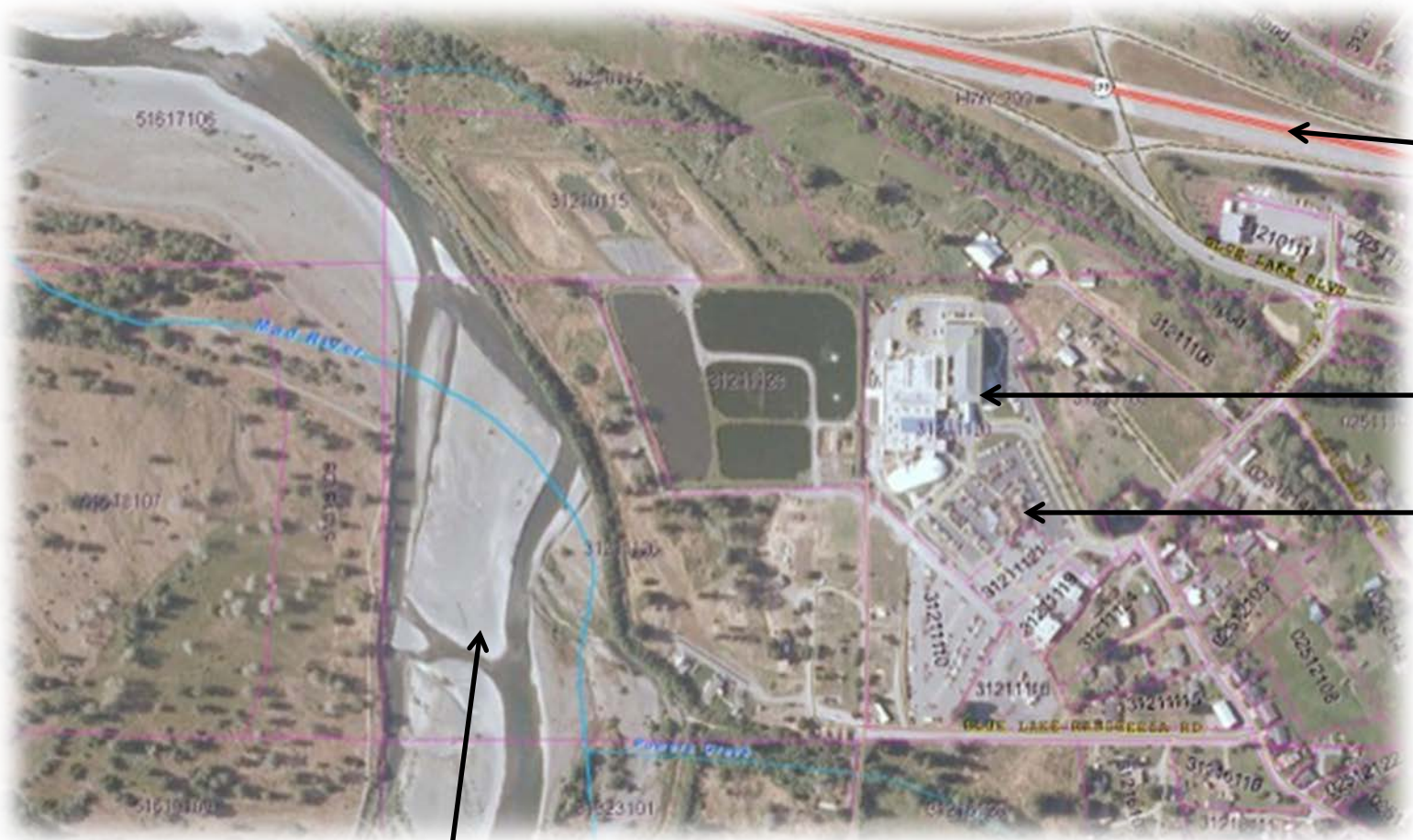
[www.bluelakerancheria-nsn.gov](http://www.bluelakerancheria-nsn.gov)

Oregon / California  
Border

Blue Lake Rancheria

Sacramento  
Region





Hwy 299  
(connects the  
Pacific Coast  
to Interstate 5)

Casino & Hotel

Tribal Office

Mad River



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# Blue Lake Rancheria, California

- ❖ Federally Recognized | 51 Tribal Members
- ❖ ~100 Acres of Trust Land
- ❖ Variety of Economic Enterprises
- ❖ ~400 Employees | 2,000 Visitors Daily
- ❖ Trust lands span the Mad River | Co-manager



# Energy Vision

- ❖ Community-wide Energy Strategy
- ❖ Climate Action / GHG Reductions
- ❖ Community Resiliency / Energy Security
- ❖ Levelized (Predictable) Cost of Energy / Economic Development
- ❖ Goals: 40% GHG Reductions by 2018 (2014 baseline)  
100% renewable energy through onsite generation



# Climate Change Data - Global

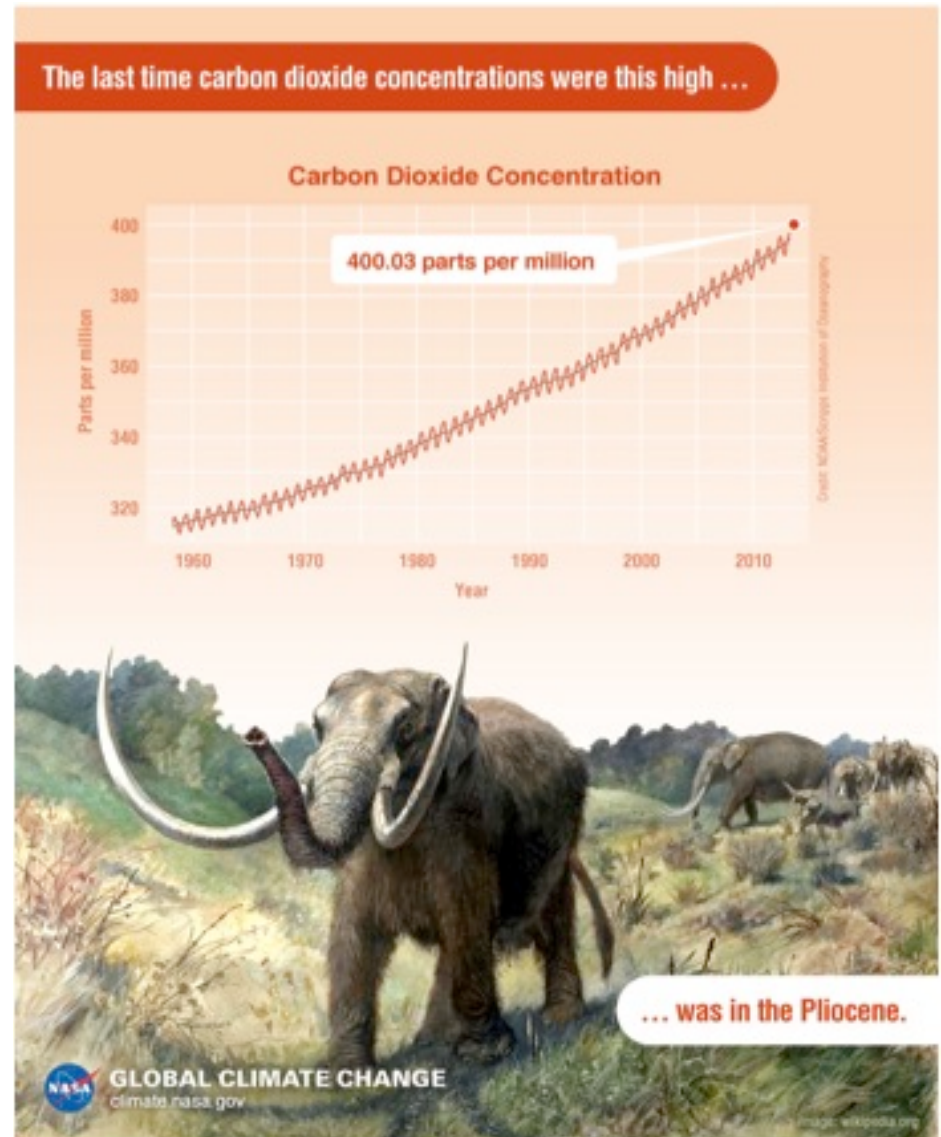
❖ **2015: July was Hot.**  
Highest Temperatures in  
Modern Record  
(NOAA)

❖ **Global sea level rise: ~6.7**  
inches in the last century -  
and, in the last decade, the  
*rate* has nearly doubled.  
(NASA)

❖ **“Scientific evidence for  
warming of the climate  
system is unequivocal.”**  
(IPCC)



<http://climate.nasa.gov>



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# Local Climate Change Impacts

- ❖ Big Wildfires
- ❖ Drought & Water Shortage
- ❖ Extreme Storms & Floods
- ❖ Infrastructure Damage
- ❖ Threats to Life & Safety





# Energy Drivers

## ❖ Greenhouse Gas Reductions

### ➤ Energy Strategy

- Energy Efficiency
- Transition from Fossil to Green Fuels
- Transition from conventional energy to renewable energy
- Support regional GHG reductions

## ❖ Improve Community Resiliency

- Develop energy security through islanded power capability onsite
- Develop water, food, shelter, and communications security
- Create long-term operability as a regional emergency site.



North



(Future/New) Grid Battery Storage and microgrid control room

Small Groundwater Well; Currently unfiltered water; ? GPM capacity

Solar Array ~500 kW (Future/New)

175kW Renewable Energy (biomass to fuel cell) Distributed Generation Power System (in operation 3/15); 10 days islanded operation (via biomass fuel storage)

1MW Generator Diesel powered; 3,000 gallon tank; 50 gallons per hour consumption rate = ~120 hours of islanded operation, depending upon energy use.

Blue Lake Hotel - 2,000A / 480V / 3 phase service; powers hotel + renewable energy system. 102 hotel rooms for shelter in place

Blue Lake Casino - 2,000A / 480V / 3 phase service; powers casino and sapphire palace + receives energy from renewable energy system. 44,000 square feet; 3 restaurants; 4 sets of restrooms

UPS - 2 Liebert (150 kVa and 50 kVa) and 1 MGC (36 kVa) battery banks; 15 minutes of islanded operation (slot machines servers, e lighting)

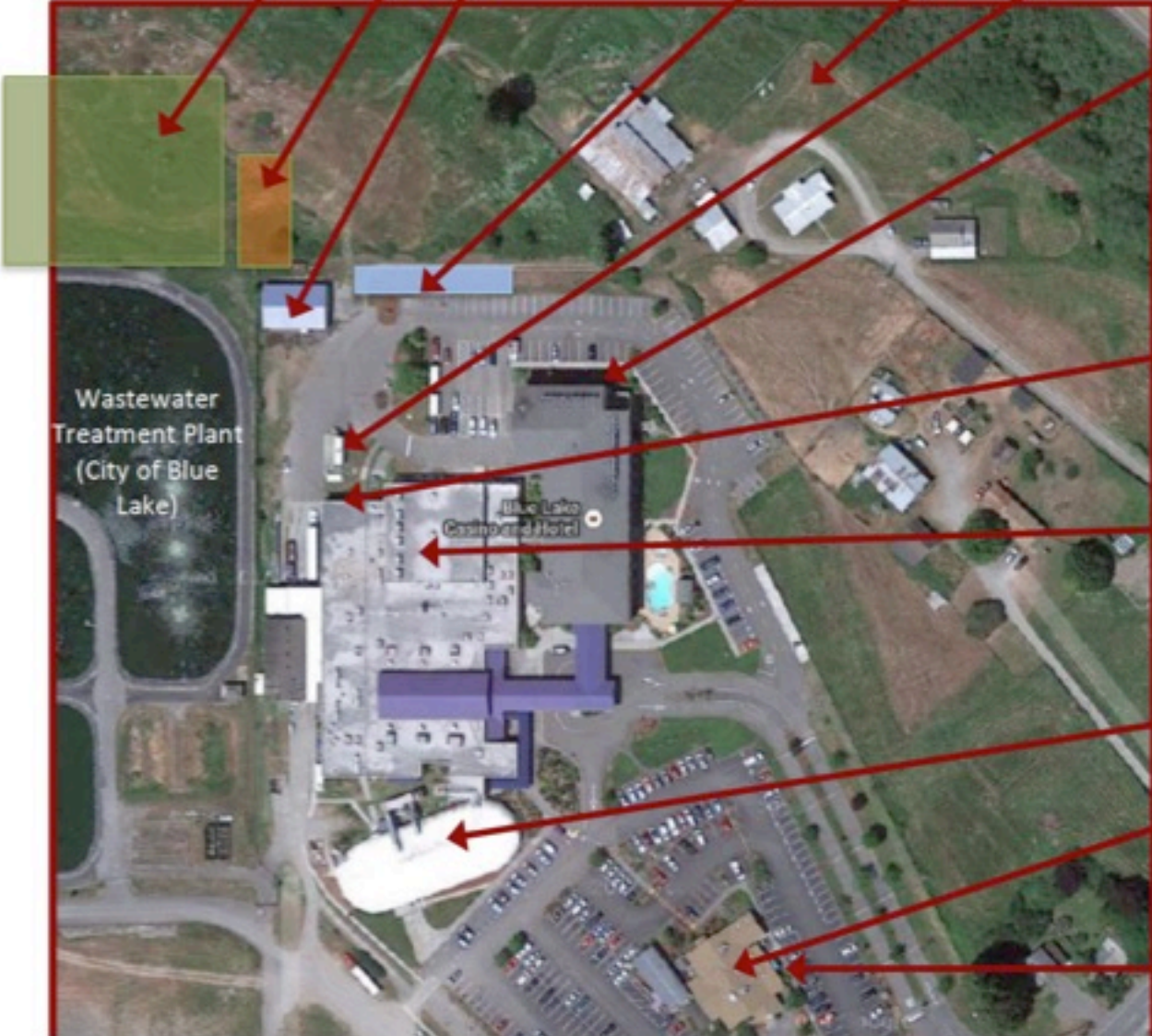
Sapphire Palace - receives energy from casino service. 800-person capacity; 1 set of restrooms; available shelter-in-place and/or medical facility.

Tribal Office - Separate meter. Kitchen facilities, 1 set of restrooms (septic system)

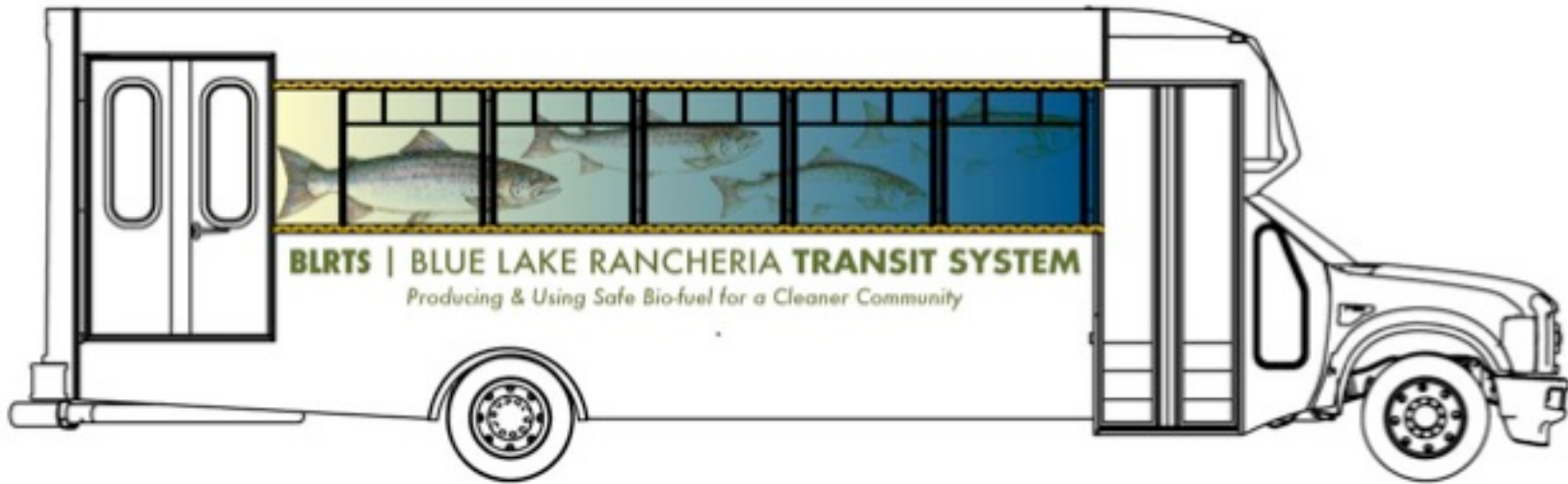
80kW Generator for Tribal Office; ~24 hours of islanded operation

Wastewater Treatment Plant (City of Blue Lake)

Blue Lake Casino and Hotel



# Current Energy Projects



- ❖ Biodiesel Transit
- ❖ Waste oil from Tribe's commercial kitchens
- ❖ B20 blend; achieves ~40% GHG reductions.



# Current Energy Projects

- ❖ Energy Efficiency
- ❖ Solar Arrays for Tribal Residences
  - GRID Alternatives
  - Solar Career Training
- ❖ Regional Electric Vehicles (EV) & Infrastructure
  - 2 Level 2 EV Charging Stations
  - Migration of Tribal Fleet



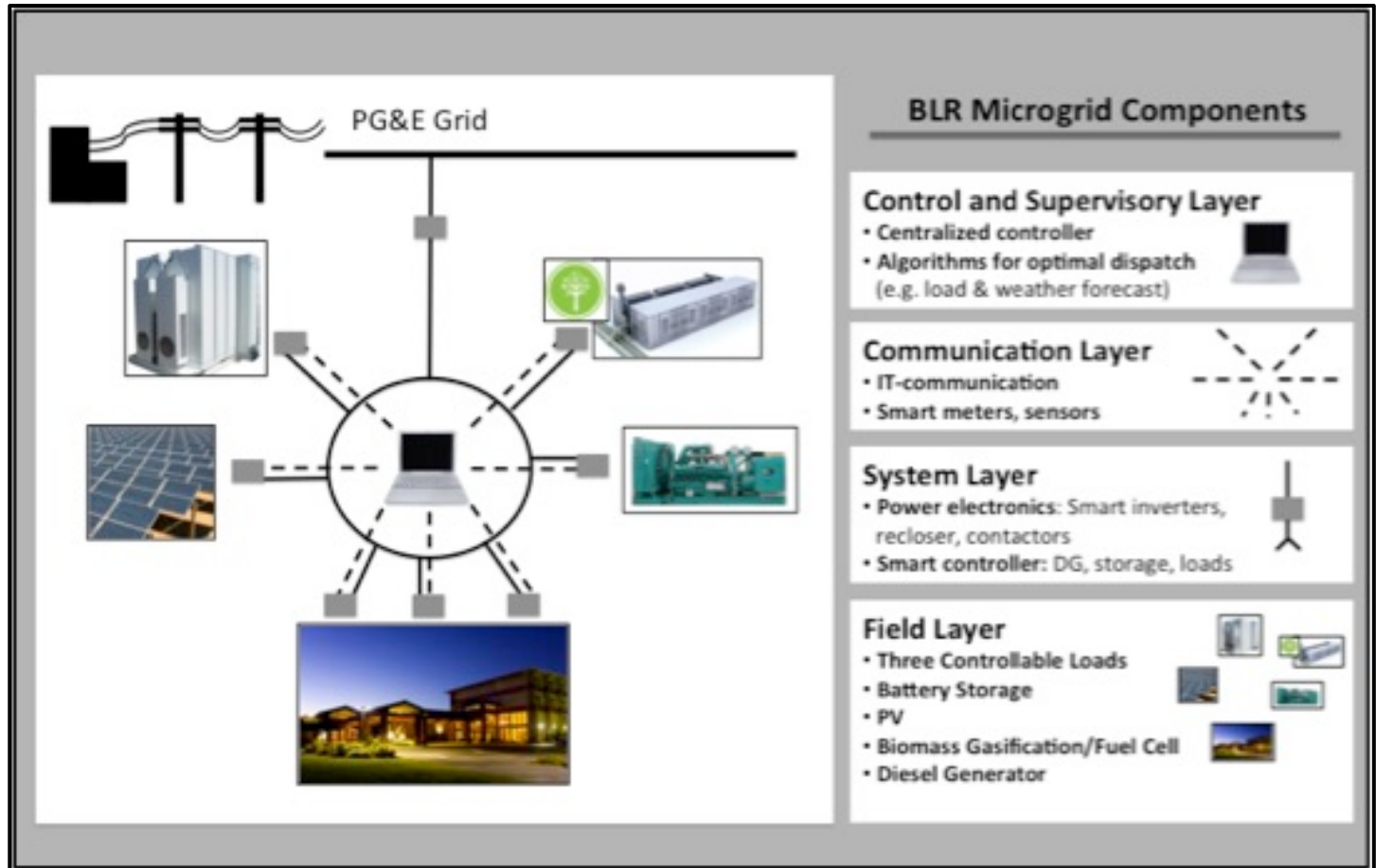
# Current Energy Projects

- ❖ Onsite Renewable Energy
- ❖ 175kW Biomass-to-Fuel Cell
  - Supported by California Energy Commission “Public Interest Energy Research (PIER) Program”
  - Improves community resilience
  - Reduces GHGs
  - Tribal, regional, and state partnership
  - Replaces ~1/3 baseload power with renewable source.
  - Makes beneficial use of biomass waste



# Current Energy Projects

- ❖ Microgrid + Solar Array .5 MW + Battery Storage 1MWh



# Current Energy Projects

## ❖ Microgrid Financial Considerations

- Secondary to primary utility customer
- Virtual aggregated net metering
- Aggregator of distributed energy resources will be able to directly participate in the CAISO market
- Generation components can be scaled up
- Grid can be expanded (economic enterprises, critical infrastructure, residences)



# START Program

- ❖ Selected as a START recipient \*Thank You!\*
- ❖ Communications
  - Quantify progress
  - Educate stakeholders and audiences (internal and external)
  - Case study development
- ❖ Monitoring & Verification (M&V)
  - Contract review
  - Establish benchmark data to prove GHG reduction progress





# Energy Collaboration

## Tribal

- ✧ Tribal Government
- ✧ Tribal Members
- ✧ Department of Energy and Technologies
- ✧ Environmental Programs
- ✧ Office of Emergency Services
- ✧ Wildland Fire Department

## Local, Regional, State, National

- ✧ **U.S. Department of Energy, Office of Indian Energy, Policy and Programs**
- ✧ **National Renewable Energy Laboratory**
- ✧ Humboldt State University
- ✧ Schatz Energy Research Center (SERC)
- ✧ Redwood Coast Energy Authority
- ✧ U.S. Department of Interior
- ✧ NOAA
- ✧ Pacific Gas & Electric
- ✧ California Energy Commission
- ✧ U.S. Department of Agriculture
- ✧ Humboldt Bay Municipal Water District
- ✧ Humboldt County OES
- ✧ American Red Cross

